Mapping California's Wildland

2007 fire hazard zones target structure survivability

By Dean Cromwell, manager, Fire and Resource Assesment Program, Sacramento Headquarters

Buildings in many parts of California can be lost in a wildfire. Years of experience by fire agencies and others have led to a statutory strategy for reducing the chance of building loss or damage. It is a two-pronged approach: 1) defensible space - reduce vegetation around homes to keep direct flames and heat away from the sides of buildings; and 2) ignition resistant buildings - construct buildings so that they have less chance of catching fire from burning embers.

Kate Dargan, State Fire Marshal, explained: "Most of the highest wildfire losses take place during hot, windy days or nights when flames spread so fast that many buildings catch fire and overwhelm available firefighting forces." Buildings catch fire when burning embers enter the building. Examples are embers falling on wood roofs, blowing in through vents, piling up in cracks, and being lodged under boards. By constructing buildings in a way that cuts down the ability of embers to intrude, a major cause of fire spread is reduced.

Dargan pointed out that recently adopted building code standards do exactly that: reduce the risk of burning embers igniting buildings. She indicated that standards already in effect place provisions on roofing and attic venting. Dargan added: "New building code standards for California, which take effect January 2008 require ignition-resistant siding and decking, double-paned windows, enclosed overhanging decks, and eave and wall vents that reduce ember penetration.

Above, a look at the draft updated Fire Hazard Severity Zoning Map.

"This project is taking a bite out of one of the important wildland-urban interface issues facing California – that is structure survivability during conflagrations," said Dargan. "Requiring that homes in hazard areas are built using ignition-resistant methods and materials will affect how we fight fires, the number of structures lost and the cost of suppression."

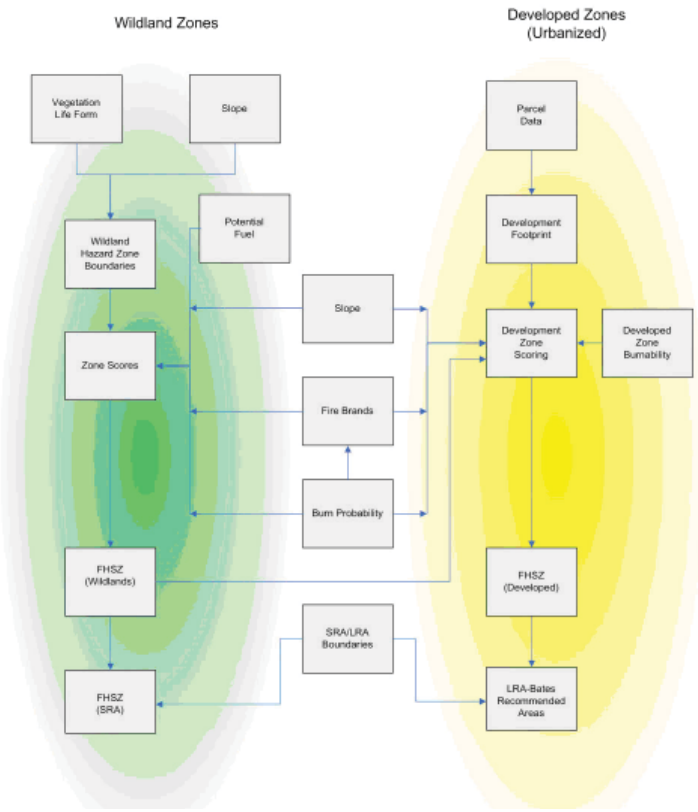
In some instances, these new standards tie requirements to the fire hazard severity zone rating of a building site. Roofing standards vary by the hazard zone rating of the site. Other standards apply throughout areas where the State has financial responsibility for fire protection and areas in local jurisdiction designated as having a very high fire hazard zone ranking.

As part of implementing the new regulation, the Fire and Resource Assessment Program (FRAP) is redoing the maps for fire hazard severity zones.

"We realized that if the building standards were going to be based on these maps, they needed to be accurate because they are going to undergo a lot of scrutiny," Dargan said. The existing state responsibility area fire hazard maps were developed in the mid-1980s, using mapping techniques and information available then.

Local responsibility area maps were developed in the mid-1990s. It was clearly time to update the maps to ensure that they identify the hazard correctly.

Over a two-year process, FRAP's mapping experts, led by Dave Sapsis, developed a new model that would serve as the basis of zone assignments. The model evaluates each property using characteristics that affect the probability of the area burning and potential fire behavior in the area based on elements such as fire history, potential fuel over a 30- to 50-year period, flame length, blowing embers, terrain, weather and the likelihood of buildings igniting.



The above model shows the different factors used to determine the fire severity zones.

"The updated maps reflect improved fire science, mapping techniques, and data," explained Sapsis. "It is important to note that the fire hazard severity zone maps evaluate 'hazard,' not 'risk,'" Sapsis added. Hazard is based on the physical conditions that give us a likelihood that an area will burn over a 30- to 50-year period without considering modifications such as fuel reduction efforts. Risk is the potential damage a fire can do to the area under existing conditions, including any modifications such as defensible space, irrigation and sprinklers. In this way, fire hazard maps are like local flood zone maps.

The minimum zone size varies from 20 acres in urbanized areas to 200 acres in wildland areas. "Urban areas have different fire hazards because they have different types of fuels in varying amounts as well as increased fire detection and response," according to Sapsis. Urban/developed zones are determined by a combination of parcel data, census data, and FRAP's statewide vegetation map data. Urban zones are classified by the wildland hazard near the developed area, the vegetation density in the developed area, and the likely influence of embers.

Draft maps have been reviewed by the 21 CAL FIRE units statewide and six contract counties; their recommendations for changes are now being reviewed. Maps for areas where the State has financial responsibility for fire protection, called state responsibility areas, are set for public release in May. A comprehensive public hearing process will take place in June and July 2007. Recommendations for very high fire hazard severity zones in areas of local responsibility will be made early next year.

As part of the regulatory process to adopt maps, CAL FIRE will host public hearings in each of the 56 counties that have state responsibility area lands. Prior to the public hearings, local officials in each affected community will receive a package containing background information and a link to online maps for review. At the hearings, CAL FIRE staff experts will explain the science-based model used to develop the 2007 version of the fire hazard severity zone maps and take public comment. A media and public outreach effort will coincide with each hearing.

The adoption process for the local responsibility area maps will be conducted by the local government agencies. Local governments will conduct public hearings and adopt local ordinances. CAL FIRE will provide technical assistance throughout this process.

Updated information and support documents for FHSZ are available on FRAP's website at http://frap.cdf.ca.gov/fhsz/review.html